Listing of Claims

IN THE CLAIMS:

The following listing of claims is intended to supercede all previously filed listings of claims. Changes are shown with deletions in ~~strikethrough~~ and additions underlined.

Claim 1 (Currently Amended). A passive device for reducing noise in a hydraulic system including ~~at least one~~ a fluid conduit for carrying pressurized fluid, the device comprising:

a substantially rigid tubular element having an open end and a closed end, the open end of the tubular element adapted to be attached to the fluid conduit so that the ~~tube~~ tubular element fills with the pressurized fluid in communication with the fluid in the system~~; and the~~ an area and length of the ~~tube~~ tubular element adapted so that the fluid within the ~~tube~~ tubular element has a resonant condition at a frequency that is the same as at least one frequency of the noise that is to be reduced in the hydraulic system.

Claim 2 (Currently Amended). A hydraulic system of pressurized fluid for reducing noise, the system comprising:

a fluid conduit for carrying the pressurized fluid; and

a substantially rigid tubular element having an open end and a closed end, the open end of the tubular element attached to the fluid conduit so that the ~~tube~~ tubular element fills with the pressurized fluid ~~in communication with the fluid in the system;~~, the tubular element having an associated length and an associated cross-sectional area, ~~wherein~~ the area and length of the tube are predetermined so that the fluid within the tube has a resonant condition at a frequency that is substantially the same as at least one frequency of the noise that is to be reduced in the hydraulic system.

Claim 3 (Currently Amended). A helicopter having a main rotor system including an engine, a transmission, a main rotor, and an airframe, the improvement comprising:~~, and a hydraulic system of pressurized fluid for reducing the transfer of vibration from the main rotor~~

~~system to the airframe, and a passive device for reducing noise in the hydraulic system, the device comprising~~:

a substantially rigid tube having an open end and a closed end, the open end of the tube adapted to be attached to ~~the~~ a hydraulic system, the hydraulic system being configured to control an actuator using pressurized hydraulic fluid, the closed end of the tube being remote from the hydraulic system~~, the tube being filled with the pressurized fluid in communication with the fluid in the system; and~~, the tube having an associated length and an associated cross-sectional area, the cross-sectional area and length of the tube being ~~adapted so~~ configured such that the hydraulic fluid within the tube has a resonant condition at a frequency that is substantially the same as at least one frequency of the noise that is to be reduced by the hydraulic system.

Claim 4 (New). The passive device of claim 1, further comprising:

a cap located proximate to the closed end of the tubular element;

a rod configured to be inserted through the cap into the closed end of the tubular element; and

a movable piston, the rod being configured to engage the movable piston.

Claim 5 (New). The passive device of claim 4, wherein the cap includes a threaded orifice and the rod is a threaded rod.

Claim 6 (New). The passive device of claim 1, further comprising:

a cap located proximate to the closed end of the tubular element;

a rod configured to be inserted through the cap into the closed end of the tubular element and being configured to engage a movable piston within the tubular element, whereby a movement of the rod causes an associated movement of the movable piston, thereby changing a fluid column length.

Claim 7 (New). The passive device of claim 6, wherein the cap includes a threaded orifice and the rod is a threaded rod.

Claim 8 (New). The passive device of claim 1, wherein the substantially rigid tubular member is a steel tubular member.

Claim 9 (New). The hydraulic system of claim 2, further comprising:

a controller;

a sensor, the sensor being configured to sense a quantity and to output a signal associated with the sensed quantity to the controller;

an actuation system, the actuation system being configured to receive a control signal output from the controller, the actuation system also being configured to control an actuator to reduce vibratory loads.

Claim 10 (New). The hydraulic system of claim 9, wherein the actuator includes an inlet, the inlet being configured to receive hydraulic fluid via the fluid conduit, and the tubular element being spaced proximate to the inlet such that a fluid line diameter is substantially constant between the tubular element and the inlet.

Claim 11 (New). The hydraulic system of claim 9, wherein the actuator is configured to receive vibratory loads include a shear load and a moment load.

Claim 12 (New). The hydraulic system of claim 11, wherein the actuator includes a bearing assembly and a piston, the bearing assembly being configured to prevent the shear load and the moment load from being fully imparted on the piston.

Claim 13 (New). The hydraulic system of claim 2, further comprising:

a cap located proximate to the closed end of the tubular element;

a rod configured to be inserted through the cap into the closed end of the tubular element; and

a movable piston, the rod being configured to engage the movable piston.

Claim 14 (New). The hydraulic system of claim 2, further comprising:

a cap located proximate to the closed end of the tubular element;

a rod configured to be inserted through the cap into the closed end of the tubular element and being configured to engage a movable piston within the tubular element, whereby a movement of the rod causes an associated movement of the movable piston, thereby changing a fluid column length.

Claim 15 (New). The helicopter of claim 3, wherein the noise that is to be reduced by the hydraulic system is gear clashing noise originating within the transmission of the helicopter.

Claim 16 (New). The helicopter of claim 3, further comprising:

a controller;

a sensor, the sensor being configured to sense a quantity and to output a signal associated with the sensed quantity to the controller;

an actuation system, the actuation system being configured to receive a control signal output from the controller, the actuation system also being configured to control an actuator to reduce vibratory loads.

Claim 17 (New). The helicopter of claim 16, wherein the actuator is configured to suppress vibratory loads produced by a gear box and the airframe based on a change in pressure within the hydraulic system.

Claim 18 (New). The helicopter of claim 16, wherein the actuator includes an inlet, the inlet being configured to receive hydraulic fluid via the fluid conduit, and the tubular element being spaced proximate to the inlet such that a fluid line diameter is substantially constant between the tubular element and the inlet.

Claim 19 (New). The helicopter of claim 16, wherein the actuator includes a bearing assembly and a piston, the bearing assembly being configured to prevent a shear load and a

moment load from being fully imparted on the piston.

Claim 20 (New). The helicopter of claim 3, further comprising:

a cap located proximate to the closed end of the tubular element;

a rod configured to be inserted through the cap into the closed end of the tubular element and being configured to engage a movable piston within the tubular element, whereby a movement of the rod causes an associated movement of the movable piston, thereby changing a fluid column length.